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Typesetting at the CIA

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Because of necessary security conditions, little is known regarding the operations of the CIA Printing Services Division in McLean, Virginia. A brief review of the computer-assisted phototypesetting system, is presented in this report by George Kunkel, who gave a slide-presentation on the subject at a recent meeting of the Printing Industry of Washington.

George Kunkel is a printer by trade, having been a partner in the printing business in Washington. He has assisted with the installation and operation of a photocomposing system in CIA and in 1962 was assigned to the staff of the Division Chief of the Printing Services Division.

Considerable developmental work is being done in the Central Intelligence Agency regarding type composition and the computer. One important system is being built — well underway, but not yet operational.

We previously got our feet damp, if not wet, in two computerized composition programs which we have written. One converts tab card data to justified TTS tape for linecasting, and one is now justifying TTS tape for use on the Photon 513. These programs are simple — they work — but they do not represent a system, nor have they saved us any money as they are interim programs with which we are experimenting until our main system of computerized page composition is operational.

As the printers for the Central Intelligence Agency, the Printing Services Division is charged with the responsibility for the preparation, including composition, and printing of the classified material required for the operation of the Agency.

We are convinced—not by emotion or me-too-ism, but by thorough investigation—that our composing chores can be expedited and the work produced more economically with a computer assisted photocomposing system. I emphasize the word *system*. We are not justifying our effort by the increased keyboard production which may result from computer end-of-line decisions. We feel that the gain will be in the use of the system as a whole, and that a substantial part will be in using the computer for page makeup and in correcting errors before setting the type.

An overall system makes it possible to use a basic font that is compatible to a typewriter, the Photon, and the 1403 lineprinter. The format and style instructions for the system are within the capability of the typewriter keyboard, but these instructions are going to be keyboarded by the printer.

For the clean tape goal we have a correction procedure, using one update program, which is applicable to each phase of the composing program. And for page composition we have a caster, the Photon 513, which is completely—in fact only—controllable by tape and has all the machine functions necessary to do the job.

All paper tape going into the system is run through a Digi-Data paper tape to magnetic tape converter. It has plugboards which will be used to solve interface problems caused by different coding systems. It is a one-for-one converter. This item will allow for faster read-in on the computer.

After conversion the tape is introduced into Phase 1 which addresses the data, creates a magnetic tape record and produces a lineprinter proof. Customer tape will run through this phase so that our printers can address corrections and style and format instructions to the material before committing it to the next phase. If necessary the printer can request an updated Phase 1 proof after computer updating. This would be done if the corrections and revisions to the original were extensive. This phase is the fastest and least sophisticated of the four. Phase 1 will accept style and format instructions and reproduce them but cannot act upon them.

After style and format codes and corrections are entered by way of a correction tape, the data is passed through Phase 2. It does justification arithmetic, records its efforts on magnetic tape, and produces a lineprinter proof which is a line-for-line representation of a justified galley. Here again there is an option on the update. This phase is, incidentally, also the entry point for material originating at the printer's keyboard.

With the Phase 2 proof in hand, the printer prepares page makeup instructions. He indicates where he wants to end columns and where graphics are to appear. The material is then passed through Phase 3, which does its leading and spacing arithmetic, creates a new magnetic tape record and produces a lineprinter proof broken up into columns—not side-by-side columns—there is not enough room on the proof sheet.

We will use this proof in lieu of a page proof which traditionally goes to the author. We don't like to think about further revision of text at this stage, but we do realize that revisions will occur —nobody has yet abolished author's alterations. But when they do occur the update program will do its duty, and if rejustification must be done, vertically or horizontally, the proper routines will be called in and the work performed. Corrections after page makeup are not desirable — in this system or any other—and we don't plan to have any.

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The proofs that I have been mentioning will contain, besides the text data, all information that the proofreader needs to satisfy his requirements. No hidden conditions—no phantom codes to haunt him later.

Phase 4 — the happy ending — produces final Photon tape. It converts the BCD codes used by the computer to six-level TTS codes, which the Photon uses; sorts out the opposing lines in the justified columns so that the Photon will set them in one sweep. It will have to account for leading adjustments between columns because the bases of the opposing lines will not be common. This part of the system has raised the eyebrows of our programmer, but he has manfully promised fulfillment. It's a tough arithmetic problem — but that is what the computer was made for.

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